

ISSUANCE DATE AND SIGNATURE PAGE
U.S. ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT: CLASS I
Permit Number AK-1I005-B

In compliance with provisions of the Safe Drinking Water Act (SDWA), as amended, (42 U.S.C. 300f-300j-9), and attendant regulations incorporated by the U.S. Environmental Protection Agency (EPA) under Title 40 of the Code of Federal Regulations, Hilcorp Alaska LLC (Hilcorp) (Permittee) is authorized to inject non-hazardous industrial waste utilizing up to four (4) Class I injection wells at the Milne Point Unit (MPU) located on the Alaskan North Slope (NS). Injection is authorized into the Schrader Bluff (West Sak) and Ugnu (Prince Creek) Formations, in accordance with Title 40 C.F.R. § 144.33 and the conditions set forth herein. The Milne Point oilfield located in the MPU near the Beaufort Sea about 250 miles north of the Arctic Circle and lies west of Prudhoe Bay, on the North Slope of Alaska approximately 25 miles west of Deadhorse, Alaska. The proposed disposal well(s) are in an area where there are no underground sources of drinking water (USDWs) and an aquifer exemption delineated by a cylinder along the well trajectory of the Class I injection well(s) from (below permafrost) 2000 feet true vertical depth (TVD) to 4270 feet TVD. The aquifer exemption was issued by EPA on September 29, 2004 for aquifers between approximately 2000 feet (base of the permafrost) and 4,270 feet true vertical depth subsea (TVDss) and was clarified to include the area delineated by a cylinder of ¼ mile radius along the well trajectories whose latitudes and longitudes (per NAD83) respectively at the well surface location are latitude 70.472809 and longitude -149.413148 for well MPB-50, latitude 70.757984 and longitude -149.4119660 for well MPB-34, latitude 70.4728 and longitude -149.4131 for well MPB-52 and latitude 70.475454 and longitude -149.415140 for well MPB-24. (Exact well locations are subject to change or correction.) Injection of hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA), as amended, (42 USC 6901) or radioactive wastes (other than naturally occurring radioactive material – NORM from pipe scale) are not authorized under this permit. All references to Title 40 of the Code of Federal Regulations are to regulations that are in effect on the date that this permit is issued. Figures and appendices are referenced to BP Exploration (Alaska) Inc. (BPXA's) Renewal Application for Milne Point Unit UIC Permit AK-1I005-A dated April 30, 2014.

This permit shall become effective on November 3, 2014, in accordance with 40 C.F.R. § 124.15. This permit and the authorization to inject shall expire at midnight, November 2, 2024, unless terminated.

Permit modification signed this 12th day of June, 2018, and goes into effect on June 12, 2018.



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PART I

GENERAL PERMIT CONDITIONS

A. EFFECT OF PERMIT

The Permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The Permittee shall not construct, operate, maintain, convert, plug, abandon, or conduct any other activity in a manner that allows the movement of any contaminant into USDWs, except as authorized by 40 CFR Part 146. The underground injection activity, otherwise authorized by this permit shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 142 or may otherwise adversely affect the health of persons or the environment. Compliance with this permit during its term constitutes compliance for purposes of enforcement with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other law governing protection of public health or the environment from imminent and substantial endangerment to human health or the environment.

This permit may be modified, revoked and reissued, or terminated during its term for cause. Issuance of this permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. This permit does not authorize any above ground generating, handling, storage, or treatment facilities.

This permit is based on the permit application submitted by BP Exploration (Alaska) Inc. (BPXA) on April 30, 2014, and supplemental material related to the aquifer exemption ruling granted by EPA dated September 29, 2004. This permit incorporates information from well completion reports for MPB-24, MPB-34, and MPB-50. A major modification was made to this permit on January 19, 2016, to expand the number of injection wells covered under the terms of the permit from two to four. Another major modification was made to this permit on June 12, 2018, to reflect the completion of a third well (MPB-34) at the Milne Point facility, to increase the frequency of tubing inspection if an injection well is used to inject slurry, and to increase the maximum allowable annular pressure.

B. PERMIT ACTIONS

1. Modification, Reissuance, or Termination

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 C.F.R. §§ 144.39 and 144.40. In addition, the permit can undergo minor modifications for cause as specified in 40 C.F.R. § 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.

2. Transfer of Permits

This permit is not transferable to any person except after notice to the Director on APPLICATION TO TRANSFER PERMIT (EPA Form 7520-7) and in accordance with 40 C.F.R. § 144.38. The Director may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the SDWA.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 C.F.R. Part 2, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed in 40 C.F.R. § 2.203 and on the application form or instructions, or, in the case of other submissions, by stamping the words "confidential" or "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 C.F.R. Part 2 (Public Information).

Claims of confidentiality for the following information will be denied:

1. The name and address of the Permittee.
2. Information that deals with the existence, absence, or level of contaminants in drinking water.

E. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply

The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application; except that the Permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 C.F.R. § 144.34.

2. Penalties for Violations of Permit Conditions

Any person who violates a permit condition is subject to a civil penalty value calculated on a per day basis of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine calculated on a per day basis of the violation and/or being imprisoned.

3. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. To be timely, a complete application for a new permit must be received at least 180 days before this permit expires.

4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

5. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

6. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit. De-characterized waste may be appropriately disposed in a Class I non-hazardous well [refer to 40 C.F.R. § 148.1(d)].

7. Duty to Provide Information

The Permittee shall provide to the Director, within a reasonable time, any information that the Director may request to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The Permittee shall also provide to the Director, upon request, copies of records required to be kept by this permit.

8. Inspection and Entry

The Permittee shall allow the Director, or an authorized EPA representative, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by SDWA, any contaminants or parameters at any location.

9. Records

- a. The Permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete this permit application for a period of at least three years from the date of the sample, measurement, report or application. These periods may be extended by request of the Director at any time.
- b. The Permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of plugging and abandonment. At the conclusion of the retention period, if the Director so requests, the Permittee shall deliver the records to the Director. The Permittee shall continue to retain the records after the three-year retention period unless he delivers the records to the Director or obtains written approval from the Director to discard the records. This permit does not require retention of hard copies or original records. The record keeping requirements of the permit are met by retaining the records in electronic or original hard copy format. The original records are not required to be retained when electronic versions are retained.
- c. Records of monitoring information shall include:
 - (1) The date, exact place, and time of sampling or measurements;
 - (2) The name(s) of the individual(s) who performed the sampling or measurements;
 - (3) The date(s) analyses were performed;

- (4) The name(s) of the individual(s) who performed the analyses;
 - (5) The analytical techniques or methods used; and
 - (6) The results of such analyses.
- d. Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 C.F.R. § 136.3, in appendix III of 40 C.F.R. Part 261, or in certain circumstances by other methods that have been approved by the Administrator.
 - e. All environmental measurements required by the permit, including, but not limited to measurements of pressure, temperature, mechanical integrity, and chemical analyses shall be done in accordance with EPA's Quality Assurance Program Plan.
 - f. As part of the COMPLETION REPORT, the Permittee must submit a PLAN that describes the procedures to be carried out to obtain detailed chemical and physical analysis of representative samples of the waste including the quality assurance procedures used including the following:
 - (1) The parameters for which the waste will be analyzed and the rationale for the selection of these parameters;
 - (2) The test methods that will be used to test for these parameters; and
 - (3) The sampling method that will be used to obtain a representative sample of the waste to be analyzed.

This permit covers four wells, including three active Class I wells, MPB-50, MPB-24, and MPB-34, that have been in operation since 2005, 2015, and 2017 respectively, plus one additional wells (MPB-52) that has not been constructed. An updated Waste Analysis Plan (WAP) was submitted as part of the May 18, 2017, MPB-34 Completion Report. The WAP from the completion report may be incorporated by reference to satisfy the WAP plan submittal requirements.

- g. The Permittee shall require a written manifest for each batch load of waste received for waste streams that are not hard piped and continuous. The manifest shall contain a description of the nature and composition of all injected fluids, date of receipt, source of material received for disposal, name and address of the waste generator, a description of the monitoring performed and the results, a statement stating if the waste is exempt from regulation as hazardous waste as defined by 40 C.F.R. § 261.4, and any information on extraordinary occurrences.

For waste streams that are hard-piped continuously from the source to the wellhead, the Permittee shall also provide for continuous, recorded measurement of the discharge rate and shall provide such sampling and testing as may be necessary to provide a description of the nature and composition of all injected fluids, and to support any statements that the waste is exempt from regulation as hazardous waste

as defined by 40 CFR § 261.4.

- h. Dates of most recent calibration or maintenance of gauges and meters used for monitoring required by this permit shall be noted on the gauge or meter. Earlier records shall be available through a computerized maintenance history database.

10. Reporting Requirements

The Permittee shall give notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility or changes in type of injected waste.

11. Anticipated Noncompliance

The Permittee shall give advance notice to the Director of any significant planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

12. Twenty-Four Hour Reporting

- a. The Permittee shall report to the Director or an authorized EPA representative any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Permittee becomes aware of the circumstances. If EPA or the Permittee discovers that fluids have moved above the upper confining zone along a wellbore within the AOR, then injection shall cease until the fluid movement problem can be diagnosed and corrected. The following shall be included as information that must be reported orally within 24 hours:

- (1) Any monitoring or other information that indicates that any contaminant may cause an endangerment to an underground source of drinking water.
- (2) Any noncompliance with a permit condition or malfunction of the injection system.

- b. A written submission shall also be provided within five (5) days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact date and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

13. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition Part I E.12.b.

14. Reporting Corrections

When the Permittee becomes aware that he/she failed to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Director, the Permittee shall promptly submit such facts or information.

15. Signatory Requirements

a. All permit applications, reports required by this permit and other information requested by the Director shall be signed by a principal executive officer of at least the level of vice-president, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a principal executive of at least the level of vice-president.

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

(3) The written authorization is submitted to the Director.

b. If an authorization under paragraph 15.a. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph 15.a. of this section must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

c. Any person signing a document under paragraph 15.a. of this section shall make the following certification:

"I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

The Permittee shall notify the Director no later than 45 days before conversion or abandonment of the well.

2. Plugging and Abandonment Report

The Permittee shall plug and abandon the well as provided in the Final Well Abandonment (Closure) portion (Section 6.5) of the April 30, 2014, Permit Renewal Application for Milne Point UIC Permit AK11005-A (Permit Renewal Application) submitted by the Permittee, which is hereby incorporated as a part of this permit. Within 60 days after plugging any well the Permittee shall submit a report to the Director in accordance with 40 C.F.R. § 144.51(p). EPA reserves the right to change the manner in which the well will be plugged if the well is not proven to be consistent with EPA requirements for construction and mechanical integrity. The Director may ask the Permittee to update the estimated plugging cost periodically.

3. Cessation Limitation

After a cessation of operations of two years, the Permittee shall plug and abandon the well in accordance with the plan unless he/she:

- a. Provides notice to the Director;
- b. Demonstrates that the well will be used in the future; or
- c. Describes actions or procedures, satisfactory to the Director that the Permittee will take to ensure that the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Director.

4. Cost Estimate for Plugging and Abandonment

- a. The Permittee estimates the 2017 cost of plugging and abandonment of the permitted Class I well(s) to be \$1,026,780/well. Please refer to the Cost Estimate and Financial Assurance document from Hilcorp addressed to EPA on January 12, 2017.
- b. The Permittee must submit financial assurance and a revised estimate prior to April of each year. The estimate shall be made in accord with 40 C.F.R. § 144.62.
- c. The Permittee must keep at the facility or at the Permittee central files in Anchorage during the operating life of the facility the latest plugging and abandonment cost estimate.
- d. When the cost estimate changes, the documentation submitted under 40 C.F.R. § 144.63(f) shall be amended as well to ensure that appropriate financial assurance for plugging and abandonment is maintained continuously.
- e. The Permittee must notify the Director by registered mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code,

naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding.

G. FINANCIAL RESPONSIBILITY

The Permittee shall maintain continuous compliance with the requirement to maintain financial responsibility and resources to close, plug, and abandon the underground injection well. If the financial test and corporate guarantee provided under 40 C.F.R. § 144.63(f) should change, the Permittee shall immediately notify the Director. The Permittee shall not substitute an alternative demonstration of financial responsibility for that which the Director has approved, unless it has previously submitted evidence of that alternative demonstration to the Director and the Director notifies him that the alternative demonstration of financial responsibility is acceptable.

Consistent with 40 C.F.R. §144.63 and regarding incapacity of owners or operators, guarantors, or financial institutions, the Permittee must notify the Director by registered mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. Furthermore, an owner or operator must notify the Regional Administrator by certified mail of the commencement of a voluntary or involuntary proceeding under title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in §144.63(f) must make such a notification if he is named as debtor, as required under the terms of the guarantee (§144.70(f)).

PART II

WELL SPECIFIC CONDITIONS

A. CONSTRUCTION

1. Casing and Cementing of Existing Sidetrack and/or Replacement Wells

The Permittee shall case and cement the well(s) to prevent the movement of fluids into or between underground sources of drinking water other than the authorized injection interval (see II.C.4, below). Casing and cement shall be installed in accordance with a casing and cement program approved by the Director and in accordance with EPA Class I well construction practices (40 C.F.R. § 146.12) and the State of Alaska/AOGCC Regulations (20 AAC § 25.412 and 20 AAC § 25.252).

If primary cement returns to surface are not observed for the (20 inch or other) surface casing cementing procedure, the Director or authorized EPA representative is to be notified as to the nature of the augmented testing proposed to ensure the integrity of the cement bond and adequacy of any Top Job procedure. The Cement Bond/Ultrasonic Imaging (USIT or other) logs and pressure tests (leak off test and/or formation integrity test) will be run for both the (20 inch or other) surface and (9 5/8 inch or other) injection casings to confirm zonal isolation and verify casing integrity. The Permittee shall provide not less than fourteen (14) days advance notice to the Director or authorized EPA representative for all cementing operations.

Should a change(s) be required to the design casing and cementing program (due to unanticipated conditions), the Director or authorized EPA representative shall be notified as to the nature of the change(s), so that approval is obtained from the Director or authorized EPA representative enabling the well to be drilled and completed in a safe and successful manner.

The casing, cementing and well construction data will be in compliance with the procedures outlined in Well Construction portion (Section 6), and the well schematics (Exhibits 6-1, 6-2 and 6-3) of the April 30, 2014 Permit Renewal Application.

2. Tubing, Packer and Completion Details of Existing Sidetrack and/or Replacement Wells

The well shall inject fluids through tubing with a packer. Tubing and packer shall be installed in accordance with the procedures in the permit application. The current tubing and packer locations for well MPB-50, MPB-24, and MPB 34 are approved.

In the event that a packer needs to be set or re-set at a revised depth at a later date, and the Permittee will perform a mechanical integrity test prior to resuming injection, submit the necessary data and obtain authorization from EPA prior to resuming injection. The packer will be set no more than 100 feet MD from the top of the injection zone.

3. New Wells in the Area of Review

EPA has set a quarter mile radius as the Area of Review (AOR) for this Class I UIC permit application. New Class I permitted UIC wells shall be installed in accordance with a casing and cement program approved by the Director and in accordance with EPA Class I well construction practices (40 C.F.R. § 146.12) and will also follow the State of Alaska/AOGCC Regulations (20 AAC 25.412 and 20 AAC 25.252). New wells within the AOR shall be constructed in accordance with the Alaska Oil and Gas Conservation Commission Regulations Title 20 Chapter 25. If in the future, any development or service wells are drilled that penetrate the injection intervals within the area of review, these wells shall have casing cemented to the formation throughout the entire section from 200 feet TVD below the proposed injection zone to 200 feet TVD above the injection zone as identified in the April 30, 2014 Permit Renewal Application.

B. CORRECTIVE ACTION

The applicant has identified no wells in the Area of Review (AOR) which require corrective action in order to prevent fluids from moving above the confining zone. If the applicant later discovers that a well or wells within the AOR require(s) corrective action to prevent fluid movement, then the applicant shall inform the EPA upon such discovery and provide a corrective action plan for EPA review and approval.

C. WELL OPERATION

1. Prior to commencing injection through new, existing sidetrack, and/or replacement wells, the requirements of Part II C.1.(a), (b), and (c) must be fulfilled. MPB-50, MPB-24, and MPB-34 have fulfilled these requirements prior to injection.
 - a. Construction is complete and the Permittee has submitted two copies of COMPLETION FORM FOR INJECTION WELLS (EPA Form 7520-9), see APPENDIX A; and
 - (1) The Director or authorized EPA representative has inspected or otherwise reviewed the new, existing, sidetrack or replacement injection well(s) and finds it is in compliance with the conditions of the permit; or
 - (2) The Permittee has not received notice from the Director or authorized EPA representative of intent to inspect or otherwise review the new, sidetrack or replacement injection well(s) within thirteen (13) days of receiving the COMPLETION REPORT in which case prior inspection or review is waived and the Permittee may commence injection.
 - b. The Permittee demonstrates that the well has mechanical integrity as described in Part II.C.3. Mechanical Integrity below and the Permittee has received notice from the Director or authorized EPA representative that such a demonstration is satisfactory. The Permittee shall notify EPA at least two weeks prior to conducting this initial test so that an authorized EPA representative may be present. Note: Since well MPB-50 has been on injection since 2005 and has successfully

demonstrated mechanical integrity on an annual basis, the requirements of C.1.a and C.1.b. from above have been met. MPB-24 and MPB-34 have similarly demonstrated mechanical integrity and met the requirements of C.1.a and C.1.b. However, the requirements under Part II.C.3. – Mechanical Integrity remain in force for all wells.

- c. The Permittee has conducted a step-rate injection test (SRT) and submitted a preliminary report to EPA that summarizes the results. An SRT was conducted on wells MPB-50, MPB-24, and MPB-34, and the results were submitted to the EPA. Therefore, the Permittee is not required to conduct another SRT prior to resumption of Class I injection activities upon permit modification.

2. During Injection

During injection, the well injection pressure, tubing-casing (inner) annulus pressure, injection rate, will be monitored on a continuous basis. Out-of-limit alarms and shut-off systems will be installed and the injection facility plant shall be monitored by trained and qualified operators during injection. Visual and automatic monitoring of the tubing-casing (inner annulus) and tubing pressures will occur routinely with pre-set, out-of-limit alarms to inform supervisory personnel.

The wellhead, controls, and monitoring instrumentation will be enclosed in an insulated structure.

3. Mechanical Integrity

a. Standards

The injection well(s) must have and maintain mechanical integrity pursuant to 40 C.F.R. § 146.8.

b. Prohibition without Demonstration of Mechanical Integrity

Injection operations are prohibited after the effective date of this permit unless the Permittee has conducted the following tests and submitted the results to the Director:

- (1) In order to demonstrate there is no significant leak in the casing, tubing or packer, the tubing/casing annulus must be pressure tested to at least 3,500 pounds per square inch gauge (psig) for not less than thirty minutes. Pressure shall show a stabilizing tendency. That is, the pressure may not decline more than 10 percent during the 30-minute test period and shall experience less than one-third of its total loss in the second (last) half of the 30-minute test period. If the total loss exceeds 10 percent or if the loss during the second 15 minute period is equal to or greater than one-half the loss during the first 15 minutes, the Permittee may extend the test period for an additional 30 minutes to demonstrate stabilization. However, the MIT meets criteria at the completion of the first 30-minute test if the total pressure loss in the 30

minute period is 2% or less and the pressure loss in the first 15 minutes (first time period) is more than the pressure in the second 15 minutes (second time period). MPB-50, MPB-24, and MPB-34 all demonstrated internal mechanical integrity following well completion.

After the effective start date of this permit, the SAPT will be required annually until expiration of the ten (10) year permit period. This internal mechanical integrity test (standard annulus pressure test- SAPT) will be required annually if the well is active and once every two (2) years if the well is inactive. The internal mechanical integrity test due dates may be extended up to three (3) months to accommodate constraints resulting from drilling, operational or other logistics related to operating in the Arctic North Slope environment. At the discretion of the Director, and depending on the results of the internal annulus mechanical integrity test data, the frequency for demonstrating internal mechanical integrity (no leaks in the tubing-casing annulus or in the tubing-packer assembly) may be revised (either increase or decrease in frequency) as specified and approved by the Director or authorized EPA representative.

- (2) To detect movement of fluids in vertical channels adjacent to the well bore and to determine that the confining zone is not fractured, an approved fluid movement test shall be conducted at an injection pressure at least equal to the average continuous injection pressure observed in the previous six months. Approved fluid movement tests include, but are not limited to tracer surveys, temperature logs, noise logs, oxygen activation/water flow logs (WFL), borax pulse neutron logs (PNL), or other equivalent logs. Fluid movement test procedures not previously used to satisfy this requirement must be submitted 30 days in advance and are subject to prior approval by the Director or authorized EPA representative. Copies of all logs shall be accompanied by a descriptive and interpretive report. Fluid movement/confinement logs will be run initially upon completion of a new, existing sidetrack and/or replacement well and prior to initiation of injection at start-up. After acquiring this baseline data, the fluid movement/confinement logs will be required every three (3) years while the well is active until expiration of the ten (10) year permit period. The test due dates may be extended up to three (3) months to accommodate constraints related to operating in the Arctic North Slope environment. At the discretion of the Director, and depending on the results of the baseline data, the frequency for demonstrating external mechanical integrity (no flow behind pipe and isolation above injection interval) and utilizing alternative diagnostic techniques, may be revised (either increase or decrease in frequency) as specified and approved by the Director or authorized EPA representative.
- (3) Internal tubing inspection logs (pipe analysis logs, caliper logs, or other equivalent logs) shall be run once every three (3) years while the well is active, or at the Director or authorized EPA representative's discretion, to monitor condition, thickness and integrity of the downhole tubing. Wells that inject slurried solid materials shall conduct a tubing inspection log every two

years while the well is active or at the Director or authorized EPA representative's discretion. A three month grace period is granted to the test due dates. Any exposed section of the injection casing will have to be logged during any scheduled workover for tubing change-out etc. Copies of the logs shall be accompanied by a descriptive and interpretive report.

c. Terms and Reporting

- (1) Two (2) copies of the log(s) and two (2) copies of a descriptive and interpretive report of the mechanical integrity tests identified in 3.b (2) and 3.b (3) shall be submitted within 45 days of completion of the logging.
- (2) Mechanical integrity shall also be demonstrated by the pressure test in 3.b. (1) any time the tubing is removed from the well or if a loss of mechanical integrity becomes evident during operation. The Permittee shall report the results of such tests within 45 days of completion of the tests.
- (3) After the initial mechanical integrity demonstration, the Permittee shall notify the Director of intent to demonstrate mechanical integrity at least 30 days prior to subsequent demonstrations.
- (4) The Director will notify the Permittee of the acceptability of the mechanical integrity demonstration within 13 days of receipt of the results of the mechanical integrity tests. Injection operations may continue during this 13-day review period. If the Director does not respond within 13 days, injection may continue.
- (5) In the event that the well fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity occurs during operation, the Permittee shall halt operation immediately and shall not resume operation until the Director or authorized EPA representative gives approval to resume injection.
- (6) The Director may, by written notice, require the Permittee to demonstrate mechanical integrity at any time.

4. Injection Zone

Injection shall be limited to the Schrader Bluff (also referred to as the West Sak) and the Ugnu (also referred to as the Prince Creek) Formations. The top of the injection interval will be at the TUZC stratigraphic marker (within the Ugnu Formation) with the base of the injection interval defined by the base of the Schrader Bluff Formation at the SBA5 marker (see Exhibits 3-2 - Milne Point Well B-02 Type Log and Exhibit 3-3 - Milne Point Area Cross Section Map in the 2004 original permit application). The top of the injection interval is currently at 4080' TVD (9020' MD) and the base of the injection interval is at 4923' TVD (11172' MD) in the MPB-50 reference well location. The top of the injection interval is at 4329' TVD (7366' MD) and the base of the injection interval is at 4920' TVD (9081' MD) in the MPB-24 well location. The top of the

injection interval is currently at 3907' TVD (4871' MD) and the base of the injection interval is at 4368' TVD (5355' MD) in the MPB-34 well location.

5. Waivers to UIC Program Requirements

As a result of the subsurface aquifer conditions and the aquifer exemption for Class I injection granted by EPA on September 29, 2004, there are no underground sources of drinking water below the permafrost in the MPU area of the Class I injection wells. Furthermore on July 2, 1987, EPA concurred with Alaska Oil and Gas Conservation Commission on the decision made to exempt aquifers beneath MPU for Class II injection activities, as recorded in AOGCC Area Exemption Order (AEO) two (2). EPA is granting the following waivers of UIC regulatory program requirements as listed below:

(i) Compatibility of Formation and Injectate

[40 C.F.R. §§ 146.12 (e) and 146.14 (a) (8)]:

Based upon the applicability of past injection studies, petrophysical logging data, existing rock and fluid samples plus successful injection practices into the same formation for the initial permit period and similar formations on the North Slope of Alaska, EPA is waiving the above two requirements for any additional sampling and characterization of formation fluids and injection rock matrix in order to determine whether or not they are compatible with the proposed injectate.

(ii) Injection Zone Fracturing, Ambient Monitoring and Pressure Buildup

[40 C.F.R. § 146.13 (a) (1), and (d) (1) and (2)]:

Based on log surveillance results over the initial permit period that consistently verify no significant upward movement of injected fluids in the MPB-50 well, continuity of geologic formations and that transmission through faulting is not likely to transmit fluid above the confining zone, and there are no improperly sealed, completed, or abandoned wellbores in the area of review, EPA is waiving the above three requirements of an ambient monitoring of saline aquifers above the confining zone and a monitoring program including a pressure buildup of the injection zone annually. Also, based on the above, EPA is waiving the prohibition against fracturing the injection interval, and would instead allow fracturing to a minor extent at the injection well confined to the injection zone so long as new fractures are not initiated nor existing ones propagated within the upper and lower confining zone. However, in no case shall injection pressure initiate fractures in the confining intervals above and below the injection zone. Authorized injection in the wells will be limited to the permitted injection zone injection intervals located between 4080' TVD (9020' MD) and 4923' TVD (11172' MD).

However, external mechanical integrity demonstrations are required. [See Part II C.3.b (2)].

6. Injection Rate and Pressure

Injection pressures shall not initiate new fractures or propagate existing fractures in the upper confining zone as that stratigraphic interval is described in the Milne Point Unit Well B-02 Type Log, Exhibit 3-2 of the permit application. Neither shall the maximum

injection pressure, measured at the wellhead, exceed 3000 pounds per square inch (psig), except as follows.

In the event of a plant shut-down or outage, there may be instances where injection pressures exceed 3000 psi (unrelated to fluid injection activities). In such instances, the Permittee shall notify the Director or his designee by telephone or electronic mail within twenty four (24) hours of the initial exceedance of the 3000 psig limitation and shall submit a written incident report not later than ten (10) days thereafter.

It should be noted that the wellhead working pressure limit of 5000 psig should not be exceeded at any time. Besides alarms and automatic shutdown controls, the wellhead assembly will include a surface safety valve to provide additional security.

7. Annulus Pressure

The annulus between the tubing and the long string casing shall be filled with a corrosion inhibited non-freezing solution. To accommodate swings in wellbore temperatures and tubing thermal expansion, a positive surface pressure up to 1500 psig is authorized for the inner annulus (tubing x long string injection casing) for wells MPB-24 and MPB-50, and a positive surface pressure up to 2000 psig is authorized for the inner annulus for well MPB-34.

Since the tubing-casing annulus pressure will vary due to temperature changes, the high-low annulus pressure limits can be adjusted, if necessary and upon approval by the Director or authorized EPA representative, (to include both the summer and winter ambient temperature swings).

Note: The maximum authorized inner annulus pressure is to enable shut-down and alarm systems to be set at appropriate pressure limits, so as not to shut-down the facility from unintended causes not related to direct injection activities, and is not intended to allow the Permittee to continue to maintain the well on injection, in the event of a loss of mechanical integrity or when there is pressure build-up either in the tubing by inner annulus or between the injection casing and surface casing (between the inner annulus by outer annulus), resulting in a potential sustained casing pressure scenario. In the event of a loss of mechanical integrity, then the Permittee has to meet the requirements as outlined in Part II.C.3.c.5 of this permit.

8. Injection Fluid Limitation

This permit only authorizes the injection of those fluids identified in the permit documentation. In the event that third party wastes are accepted, the third party must certify that fluids for injection are not hazardous waste or radioactive wastes. Fluids generated from Class I injection well construction and well workover, and fluids generated from the operation and maintenance of Class I injection wells and associated injection well piping, may be disposed in a Class I non-hazardous injection well. De-

characterized waste may be appropriately disposed in a Class I non-hazardous well (refer to 40 C.F.R. § 148.1(d)).

NOTE: Neither hazardous waste as defined in 40 C.F.R. Part 261 nor radioactive wastes other than naturally occurring radioactive material (NORM) from pipe scale shall be injected for disposal.

D. MONITORING

1. Monitoring Requirements

Samples and measurements collected for the purpose of monitoring shall be representative of the monitored activity.

2. Continuous Monitoring Devices

Continuous monitoring devices shall be installed, maintained, and used to monitor injection pressure and rate for those streams that are hard-piped and continuous, and to monitor the pressure of non-freezing solution in the annulus between the tubing and the long string casing. Calculated flow data are not acceptable except as a back-up system if the primary continuous injection rate device malfunctions.

3. Monitoring Direct Waste Injection

Direct waste injection pumping operations at the well site shall be continuously manned and visually monitored. During these pumping operations, a chronological record of the time of day, a description of the waste pumped, injection rate and pressure, and well annulus pressure observations shall be maintained. The person in charge of the pumping operations must be identified on the pumping record.

4. Alarms and Operational Modifications

- a. The Permittee shall install, continuously operate, and maintain alarms to detect excess injection pressures and significant changes in annular fluid pressure. These alarms must be of sufficient placement and urgency to alert operators in the control room. The Permittee shall install and maintain an emergency shutdown system to respond to losses of internal mechanical integrity as evidenced by deviations in the annular fluid pressures.
- b. Plans and specifications for the alarms shall be submitted to the Director or authorized EPA representative prior to the initiation of injection. Since well MPB-50 is an existing Class I well, and has been on injection since 2005, and the plans and specifications were submitted in the Completion Report, the monitoring and alarm systems in place for the existing well MPB-50 is hereby approved as meeting the requirements of this section.

E. REPORTING REQUIREMENTS

1. Quarterly Reports

The Permittee shall submit quarterly reports to the Director containing the following information:

- a. Monthly average, maximum, and minimum values for injection pressure, rate, and volume shall be reported on INJECTION WELL MONITORING REPORT (EPA Form 7520-8).
- b. Graphical plots of continuous injection pressure and rate monitoring.
- c. Daily monitoring data in an electronic format.
- d. Physical, chemical, and other relevant characteristics of the injected fluid.
- e. Any well workover or other significant maintenance of downhole or injection-related surface components.
- f. Results of all mechanical integrity tests performed since the previous report including any maintenance-related tests and any “practice” tests.
- g. Any other tests required by the Director.

2. Report Certification

All reporting and notification required by this permit shall be signed and certified in accordance with Part I.E.15.; electronically stored and maintained at the permittee’s facility, or company headquarters; electronically submitted to an electronic (email) address provided by the Director or authorized EPA Representative; and upon request by the Director or authorized EPA representative, submitted as a hard copy to the following address:

UIC Manager, Ground Water Unit (OCE - 101)
U.S. Environmental Protection Agency Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

APPENDIX A
REPORTING FORMS

Enclosed are EPA Forms:

7520-7	APPLICATION TO TRANSFER PERMIT
7520-8	INJECTION WELL MONITORING REPORT
7520-9	COMPLETION FORM FOR INJECTION WELLS